

## ***A spectral condition for cycles with consecutive lengths***

**Ning, Bo**  
**Nankai University**

**Time: June 17th, 14:00 - 15:00**

**Zoom meeting ID: 833 9720 9950 Password: 121323**

**Link: <https://zoom.us/j/83397209950>**

### **Abstract:**

As the counterpart of classical theorems on cycles of consecutive lengths due to Bondy and Bollobás in spectral graph theory, Nikiforov proposed the following open problem in 2008: What is the maximum  $C$  such that for all positive  $\varepsilon < C$  and sufficiently large  $n$ , every graph  $G$  of order  $n$  with spectral radius  $\rho(G) > \sqrt{\lfloor \frac{n^2}{4} \rfloor}$  contains a cycle of length  $\ell$  for each integer  $\ell \in [3, (C - \varepsilon)n]$ . We prove that  $C \geq \frac{1}{4}$  by a novel method, improving the existing bounds. Besides some novel ideas, our proof technique is partly inspired by the recent research on Ramsey numbers of star versus large even cycles due to Allen, Łuczak, Polcyn and Zhang, and with aid of a powerful spectral inequality. (Joint work with Binlong Li)